



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

RECEIVED  
PROGRAM PLANNING  
SECTION (SAT13)  
MAR 15 1993

EPA, REGION III

OFFICE OF  
AIR AND RADIATION

MAR 11 1993

NOTE

SUBJECT: March 11, 1993 Press Release on the Issue of MTBE Health Effects

FROM: Mary T. Smith, Director  
Field Operations and Support Division  
Office of Mobile Sources

TO: Regional Air Division Directors  
Regional Air Branch Chiefs  
Mobile Source Contacts

NOTE TO RECIPIENT: Please make three (3) copies of this fax transmission and distribute to all of the above-listed parties.

Attached is a copy of a March 11, 1993 press release which discusses initial data for the 1992-1993 wintertime oxygenated gasoline program. As you can see, the preliminary data suggests that the oxygenated gasoline program has resulted in a dramatic reduction in the number of days exceeding the carbon monoxide standard in 20 program areas. Your press office should have already received this press release.

The March 11 press release also addresses EPA's continuing work, in cooperation with the Centers for Disease Control, the State of Alaska, and industry to address health concerns raised in Fairbanks, Alaska. You should have received a copy of the Office of Research and Development (ORD) report entitled "MTBE-Oxygenated Gasolines and Public Health Issues" earlier this week. If you have not received this important report, please contact Al Mannato at (202) 233-9308 immediately.

Yesterday, Senator Harkin held hearing at which CDC appeared. Both API and Arco Chemical issued press statements yesterday. You may be getting calls from the press.

In closing, I would like to thank our Regional contacts for their swift response in providing us with this winter's preliminary air quality monitoring data.



United States  
Environmental Protection  
Agency

Communications, Education,  
And Public Affairs  
(A-107)



## Note to Correspondents

March 11, 1993

Initial data submitted to the EPA indicate that the new, oxygenated fuel program that began in various parts of the country this winter has resulted in sharp declines of harmful carbon monoxide emissions.

EPA said preliminary air-quality monitoring data from Nov. 1 through Jan. 31 in 20 areas operating the program for the first time show only two days when the carbon monoxide (CO) health standard was exceeded as compared to 43 days the year before, a 95 percent reduction in the number of days exceeding the standard. (These two days include one day each in Provo, Utah, and Missoula, Mont.) Although weather conditions can affect CO concentrations, the preliminary data suggest the reductions in CO levels are largely attributable to the oxygenated fuel program.

The first major clean fuel program operating under the 1990 Amendments to the Clean Air Act, the oxygenated fuel program is implemented by state and local air-pollution control agencies using EPA guidelines. The law requires the fuel in all areas exceeding the CO standard during the winter months when CO levels are higher. Though the winter season varies, the program generally operates from November through February.

Increasing the oxygen content of gasoline reduces CO emissions by improving fuel combustion, which is less efficient at cold temperatures. CO emissions are particularly high during the first few minutes after an engine is started, when it needs extra fuel to warm up.

Although the initial data indicate that the oxygenated fuel program has been successful in reducing winter CO levels, there have been some complaints from motorists that pumping the new fuel at self-service pumps has caused dizziness or headaches. EPA is working with the Centers for Disease Control, the state of Alaska and industry to undertake additional research on the effects of the fuel. EPA expects the research to be completed prior to the start of the 1993-94 oxygenated gasoline season. For information please contact Martha Casey at 202-260-4378.

John Kasper, Director  
Press Services Division





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
AIR AND RADIATION

### EPA's MTBE Background Document

As the first major program to be implemented under the Clean Air Act Amendments of 1990, the oxygenated gasoline program began on November 1, 1992, in 37 areas of country not attaining the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO). The oxygenated gasoline program requires that the oxygen content of the gasoline sold within these areas during winter months be no less than 2.7 percent oxygen by weight, a requirement met largely through the addition of the oxygenates methyl tertiary butyl ether (MTBE) and ethanol. The programs generally operate during the winter months since, in almost all areas, CO nonattainment is a cold-weather problem.

Each oxygenated gasoline program was administered by state and local air pollution control agencies with the oversight of EPA. The guidelines for this program were developed in 1991 by the EPA as part of an innovative process called Regulatory Negotiation. This negotiation process allowed the environmental community, industry, and state and local governments to play a substantial role in shaping the regulatory scheme for oxygenated gasoline, creating a uniquely effective program. Leading up to the November 1, 1992 start date, EPA worked closely with state and local officials to assist them in developing their regulations and in implementing their oxygenated gasoline programs.

Preliminary data on the ambient air quality in the oxygenated gasoline areas indicates that there has been a dramatic decline in the number of violations of the CO standard from November 1992 through the end of January 1993, compared to similar periods in previous years. In the areas that implemented oxygenated gasoline programs for the first time in 1992 (excluding California), the number of exceedances of the NAAQS for CO during the months of November, December and January declined from 43 last year to two this year. This is a 95% reduction. EPA is still in the process of collecting data from California.

Congress has targeted CO as a criteria pollutant because it is an odorless, colorless pollutant which inhibits the blood's capacity to carry oxygen to organs and tissues. People with chronic heart disease may experience chest pains on high-pollution days. Exposure to even higher levels of CO is associated with impairment of visual perception, manual dexterity and learning ability.



Increasing the oxygen content of gasoline reduces CO emissions through better combustion of fuel, which is generally less efficient in cold temperatures. Motor vehicle CO emissions are particularly high during the first few minutes after an engine is started when the motor needs extra fuel to warm up. Ninety percent of the increases in CO emissions occur during this time. Ambient CO concentrations vary with meteorological conditions, increasing significantly during periods of cold temperatures, low winds and atmospheric temperature inversions. Inversion conditions occur when ground-level air cools more rapidly than air immediately above a city. The warmer layer of upper air forms a "lid," trapping the cold air and the pollutants. The strongest inversions occur during the months of October through March.

Although the programs in most cities have run relatively smoothly, citizens in a few cities (Fairbanks and Anchorage, AK as well as Missoula, MT) have made complaints that the use of MTBE as a gasoline additive is associated with health-related symptoms (headaches, eye irritation, nausea and dizziness). Generally, when the CDC and State of Alaska administered questionnaires in Fairbanks and Anchorage, the people reporting the symptoms characterized them as mild and transient. These complaints led the Governor of Alaska to temporarily suspend the program in December, 1992. Alaska officials decided to continue the program in Anchorage until the close of the oxygenated gasoline winter season on February 28. In Missoula, a local task force was convened to examine the health issues. The panel concluded that while "a few people" may be experiencing an unusual sensitivity to MTBE exposure, there is presently insufficient evidence to justify an MTBE ban in the state. The panel concluded that the best approach in Montana may be to encourage expanded marketing of ethanol in the region in order to provide those citizens sensitive to the ethers a fuel option.

The complaints of health symptoms associated with acute exposures to MTBE-blended gasoline were unexpected for several reasons. First, seven oxygenated gasoline programs had been operating in the U.S. prior to November 1, 1992, with few to no health-related complaints. In all cases, complaints significantly tapered off in the second year of program implementation. Second, independent of the oxygenated gasoline program, MTBE has been used in the United States for many years. It is blended with "premium" gasoline, although at lower levels than used in the oxygenated gasoline program, to increase octane levels. Finally, pursuant to a 1987 consent order under the Toxic Substances Control Act, EPA required that industry conduct extensive studies of the health effects of MTBE in laboratory animals to estimate potential effects on humans. While none of the acute exposure animal studies suggested cause for concern, the animal studies would not have been able to detect the kinds of symptoms (e.g., headaches) being reported by people after acute exposure.



EPA has recently completed a comprehensive evaluation of the current MTBE-related health literature. Last month, the Agency released a paper summarizing its conclusions titled, "MTBE-Oxygenated Gasolines and Public Health Issues." In summary, this report indicates the following:

- Based on current knowledge, no definitive conclusions can be reached about the potential for acute exposure to MTBE oxygenated gasolines to cause health symptoms such as headaches and nausea. Preliminary reports of limited epidemiological studies in Fairbanks and Anchorage show that people likely to have higher exposures (e.g., taxi drivers) also have more complaints of health symptoms than others with lower exposures (e.g., university students). Anecdotal reports of similar symptoms from a few other areas (e.g., Missoula) are consistent with the epidemiological studies. Nevertheless, the epidemiological studies had no controls and may have been biased by local publicity about health complaints and/or other factors, making the studies suggestive but inconclusive.
- Based on several studies of laboratory animals exposed for long periods of time to MTBE and extremely limited exposure data, it does not appear that there is a significant risk for chronic noncancer effects of MTBE. However, the potential risk of MTBE as part of a complex mixture with gasoline is not known.
- A summary of the only study available reports that lifetime exposures of laboratory mice and rats to MTBE cause tumors of certain types at high doses. The lowest concentrations tested that caused tumors were very high (28,000 mg/m<sup>3</sup> in mice and 1,400 mg/m<sup>3</sup> in rats) relative to broad, very preliminary estimates of annual human exposure (approximately 0.05 mg/m<sup>3</sup>). The cancer risk assessment is now underway, and until it is completed, conclusions about cancer risks cannot be reached. Based on the summaries, however, there appears to be only marginal evidence for the carcinogenicity of MTBE.

In order to address the issue of health symptoms associated with acute exposures to MTBE-blended gasoline, EPA convened an intergovernmental and industry research program in January to determine whether there are acute effects associated with MTBE-blended gasoline. As an outcome of this, EPA is working with the Centers for Disease Control (CDC), the state of Alaska and industry to undertake additional research (see attached) which includes both vehicle emission tests and health studies, as well as the analysis of air and fuel samples. The Agency has dedicated almost \$1 million to this effort. This comprehensive approach is expected to yield information needed for an improved understanding of the acute effects associated with the use of MTBE-blended gasoline. The research is now underway, and we expect it will be completed prior to the start of the 1993-94 oxygenated gasoline season.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
AIR AND RADIATION

### MTBE Study on Acute Health Effects

EPA, the Federal Centers for Disease Control (CDC), the State of Alaska and industry officials have been cooperatively working together since early January on a program of study to assess the acute health effects of MTBE. The following studies are underway and/or planned:

#### 1) Epidemiology

CDC and the State of Alaska ran a series of studies in Alaska to investigate the relationship between the use of MTBE-blended gasoline and reported human health symptoms. In its first phase of study during November and December, CDC and the State of Alaska administered questionnaires to populations in Fairbanks and Anchorage exposed to MTBE and drew blood samples in Fairbanks. In February, CDC returned to Fairbanks for follow-up. A similar study using larger sample sizes than used in the Fairbanks study will be conducted by CDC, in cooperation with EPA, in two other areas: one where MTBE use has created no controversy, and, as a control, one which is not part of the oxygenated gasoline program. Questionnaires on health systems will be administered, blood samples taken and personal air monitors will be analyzed.

#### 2) MTBE Field Exposure

EPA, industry, and the Environmental and Occupational Health Sciences Institute (EOHSI) in Rutgers N.J., are just about to finalize protocols for testing to measure exposure to gasoline vapors and emissions, particularly MTBE. While operating on a "commuter-cycle", a monitoring system will measure both ambient and in-cabin emission levels. Samples will be taken while refueling, driving in traffic, idling, etc. Industry will be undertaking additional exposure studies, especially in the vicinity of service stations.

#### 3) Ambient Air

EPA and the State of Alaska have taken ambient air samples in Fairbanks. VOCs, aldehydes and CO have been measured at gasoline stations, in service station bays, indoors, and at CO monitoring sites in the city. As with the epidemiological studies, there are two phases: one conducted in November and December, the other in February.



#### 4) Human Clinical Exposure

A protocol to perform human clinical studies of MTBE is being developed. As with all human clinical studies, such work cannot begin without full approval of a human rights committee, so at present there can be no certainty as to whether the study will be conducted. If performed, humans would be exposed acutely to measured concentrations of MTBE. Questionnaires on health symptoms would be administered and other objective tests for acute effects such as eye and nose irritation would be performed.

#### 5) Emissions Testing

In order to ensure that CO benefits measured at higher temperatures will also be realized at arctic temperatures, EPA will be conducting controlled cold temperature emissions tests at subzero temperatures. Measurements will be taken for MTBE, formaldehyde, benzene, butadiene, CO, etc. In-cabin VOC and aldehyde samples will also be taken.

#### 6) Fuel Samples

The State of Alaska conducted a fuel sampling program in November and December and again in February. EPA will analyze these samples.



CARBON MONOXIDE EXCEEDANCES  
ALL NEW OXY FUELS AREAS (EXCEPT CALIFORNIA)

Month/Year	November	December	January	TOTAL
NOV, DEC 1987 JAN 1988	38	38	56	132
NOV, DEC 1988 JAN 1989	16	50	31	97
NOV, DEC 1989 JAN 1990	20	76	17	113
NOV, DEC 1990 JAN 1991	16	15	25	56
NOV, DEC 1991 JAN 1992	14	14	15	43
NOV, DEC 1992 JAN 1993 <sup>1</sup>	1 <sup>2</sup>	1 <sup>3</sup>	0	2

<sup>1</sup>The data in this row is preliminary since it has not been quality assured

<sup>2</sup> Provo, UT (1)

<sup>3</sup> Missoula, MT (1) - state claims exceptional event



### Pre-November 1992 Oxygenated Gasoline Programs

Albuquerque, NM MSA  
Colorado Springs, CO MSA  
Fort Collins-Loveland, CO MSA  
Las Vegas, NV MSA

El Paso, TX MSA  
Denver-Boulder, CO CMSA  
Reno, NV MSA  
Phoenix, AZ MSA

### Programs which Began on November 1, 1992

Hartford-New Britain-Middletown, CT CMSA  
New York-Northern New Jersey-Long Island, NY-NJ-CT CMSA  
Philadelphia-Wilmington-Trenton, PA-NJ-DE-MD CMSA  
Greensboro-Winston-Salem-High Point, NC MSA  
Cleveland-Akron-Lorain, OH CMSA  
Missoula, MT  
Seattle-Tacoma, WA CMSA  
Fairbanks, AK  
Medford, OR MSA  
Klamath County, OR

Washington, DC-MD-VA MSA  
Baltimore, MD MSA  
Syracuse, NY MSA  
Raleigh-Durham, NC MSA  
Minneapolis-St. Paul, MN-WI MSA  
Provo-Orem, UT MSA  
Portland-Vancouver, OR-WA CMSA  
Anchorage, AK MSA  
Grant's Pass, OR  
Spokane, WA MSA

### California Programs

Chico, CA MSA  
Sacramento, CA MSA  
Stockton, CA MSA  
Fresno, CA MSA

Modesto, CA MSA  
San Francisco-Oakland-San Jose, CA CMSA  
San Diego, CA MSA  
Los Angeles-Anaheim-Riverside, CA CMSA

